



SRC-131 Modbus Hotel Room Controller User Manual

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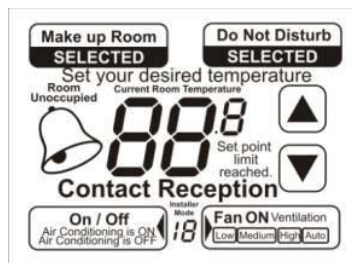
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1 Introduction

The SRC-131 controller has been designed for use in hotel rooms and other locations where the user may be unfamiliar with controller operations. In these applications it is important that the controller be very intuitive, robust and attractive. The SRC-131 controller has been designed with these important goals in mind.

The SRC-131 also offers advanced energy conservation features such as set point limit control, un-occupied heating and cooling settings as well as Modbus RTU communications for integration with the "Building Automation System" (BAS) or "Hotel Check In" system. Additionally, the SRC-131 seamlessly interfaces with the "Door Station" system.

2 Controller Operation



The SRC-131 is an extremely simple controller to operate and does not normally require a user manual or user training.

The diagram to the left shows all LCD elements and the 6 buttons (Up / Down / Make Up Room / Do Not Disturb / On – Off / Fan Mode).

Depending on switch and installer menu settings not all segments may be shown.

On/Off

Tap the On/Off button to turn the controller On or Off.

Set Temperature

Adjust the target temperature with the Up or Down button.

Fan

Single fan speed mode (Sw1=Off)

Tap the fan button to cycle between auto fan and continuous fan mode.

Three fan speed mode (Sw1=On)

Tap the fan button to cycle between low, medium, high and auto fan speeds. Press and hold the fan button to turn the fan on continuously.

Note. Option 16 in the installer menu can set the SRC-131 to reset the indoor fan to Automatic Mode (cycle on and off with heating and cooling) every time the controller is turned off.

Ventilation Mode

If permitted by DIP Sw7, the user can run the indoor fan only (Ventilation Mode) when the SRC-131 is off by tapping the fan button. Each tap of the fan button will cycle between all available fan speeds.

"Make up Room" & "Do Not Disturb" Buttons

When enabled by DIP Sw8, pressing these buttons will activate relevant LCD segments and backlight colour on the optional outside door station as well as write data to Modbus for monitoring by a BAS system.

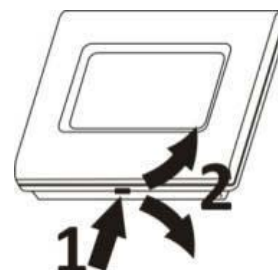
3 Installation

3.1 System Design

Great effort has been taken to make the SRC-131 system intuitive, reliable and easy to install. Using a common sense approach to the installation will ensure this product is installed easily and to the customer's satisfaction. Please read and understand this instruction manual so that installation, testing and commissioning process is undertaken in an efficient and effective manner.

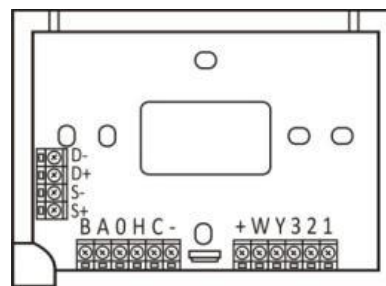
3.2 Wall Controller

Open the SRC-131 wall controller by placing a flat blade screwdriver or coin in the slot on the bottom of the controller case and push in gently inwards to release the case locking clip. Gently pry the two case halves apart at the base taking care not to twist the case as this may crack the LCD.



3.3 Wiring Terminals

B	Modbus Data B
A	Modbus Data A
0	0..10V 0V Common Terminal
H	0..10V Heating Output
C	0..10V Cooling Output
-	24V Common
+	24V Active
W	Heat (or reversing valve)
Y	Cool (or compressor)
3	Fan Speed High
2	Fan Speed Medium
1	Fan Speed Low
D-	Digital 0 Volt
D+	Digital Input Active
S-	Sensor Input 0 Volt
S+	Sensor Input Active



3.4 DIP Switch Settings

Switch	Function	On	Off
Sw1	Indoor Fan Mode	3 Fan Speed	1 Fan Speed
Sw2	Equipment Type	Heat Pump	Heat Cool
Sw3	HP Mode (Sw2= ON) HC Mode (Sw2=OFF)	Rev Valve Heat (B) HE – Fan With	Rev Valve Cool (O) HG – No Fan In Heat
Sw4	Not Used		
Sw5	Comp Protection Delay	5 Min Anti Cycle	No Anti Cycle
Sw6	Not Used		
Sw7	Ventilation Mode	Permitted	Not Permitted
Sw8	Door Station (Optional)	Fitted	Door Station Not Used

Note: The SRC-131 reads the switch settings on power up only. If you change any DIP switch settings you must cycle power or press the reset button before these changes will take effect.

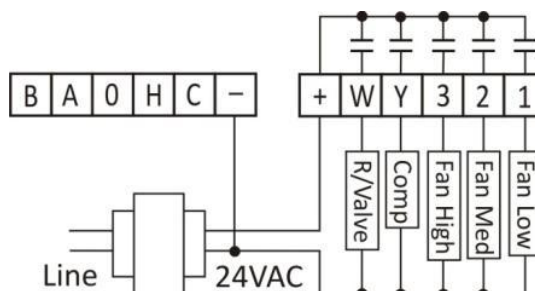
4 Wiring Examples

Provided below are a few typical examples of wiring. These can be adapted to meet specific project or user needs. For example, heat pump 3 speed fan and heat pump single speed fan are in essence the same wiring except for DIP switch 1 position and the fan med and high speed terminal wiring.

4.1 Heat Pump System - 3 Fan Speed

Switch Settings

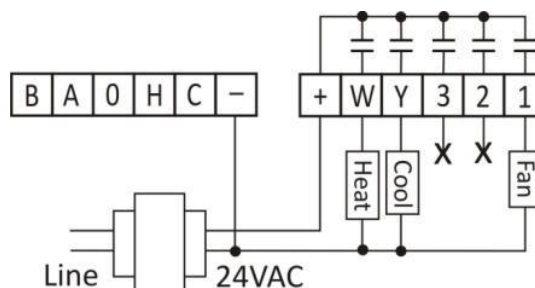
Sw1 = On - 3 Fan Speed
Sw2 = On - HP Mode
Sw3 = On/B Off/O
Sw4 = N/A
Sw5 = On - Comp Delay
Sw6 = Customer Pref
Sw7 = Customer Pref



4.2 Heat Cool System - 1 Fan Speed

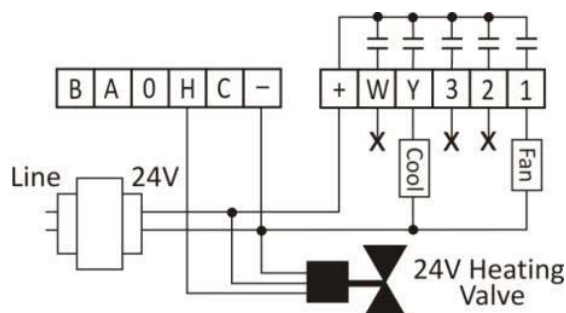
Switch Settings

Sw1 = Off - 1 Fan speed
Sw2 = Off - HC Mode
Sw3 = On/HE Off/HG
Sw4 = N/A
Sw5 = On - Comp Delay
Sw6 = Customer Pref
Sw7 = Customer Pref



4.3 0-10V Heating Valve With Cool - 1 Fan Speed

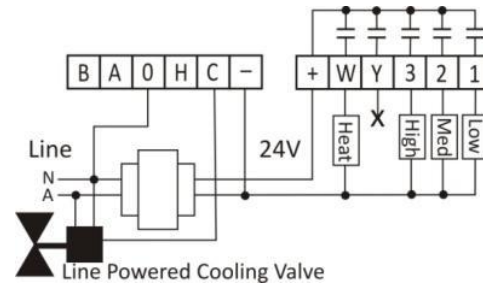
Sw1 = Off - 1 Fan Speed
Sw2 = Off - HC Mode
Sw3 = On/HE
Sw4 = N/A
Sw5 = On - Comp Delay
Sw6 = Customer Pref
Sw7 = Customer Pref



4.4 Mains Powered Cooling Valve - 3 Fan Speed

Settings

Sw1 = On - 3 Fan Speed
 Sw2 = Off – HC Mode
 Sw3 = On/HE Sw4 = N/A
 Sw5 = Off - No Delay
 Sw6 = Customer Pref
 Sw7 = Customer Pref

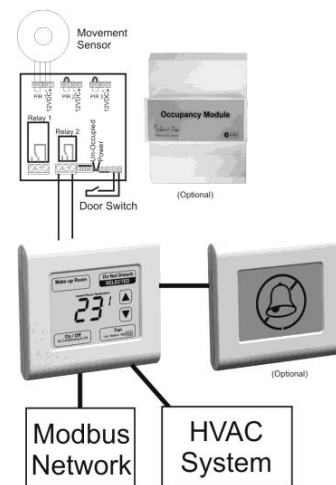


When using a separate power supply for the valve, please ensure both power supply's 0 volt terminals are joined so the 0-10V signal has a return path. In this example, the relay "Y" terminal could be used for a circulating water pump call if needed.

5 Wiring Examples – Ancillary Functions

Additional capabilities can be used when wiring the SRC-131 to external devices. These include BAS, room occupancy detection systems, door card readers and the optional SythSense outside door stations.

5.1 Complete System Overview



As can be seen by the diagram to the left, the SRC-131 is the hub of a sophisticated hotel room HVAC control and management system.

Connecting the SRC-131 to an automatic occupancy detection system such as the SythSense SRC-OC (optional) permits you to precisely control HVAC energy consumption by automatically selecting a more economical room set temperature when the room is unoccupied.

The optional door station connects quickly and easily to the SMT-131. This provides the hotel guest with the ability to request privacy or call for housekeeping when needed. A doorbell function is also provided.

Network communications enables the room to be "turned on" remotely as a guest arrives and "shut down" at checkout – further saving money on energy costs.

5.2 Modbus Wiring

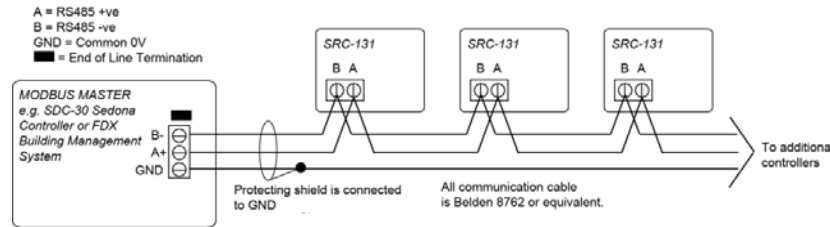
Modbus communications unlock many additional functions within the SRC-131 controller. It also permits all modes, functions and controls to be remotely supervised and adjusted from a central location if needed. Modbus object data can be found later on this manual.

The SRC-131 uses a high powered Maxim chipset that will "theoretically" permit the connection of up to 255 devices on a single Modbus node. RF noises and other interferences will reduce the real world permitted connections to a maximum of 200 in most cases.

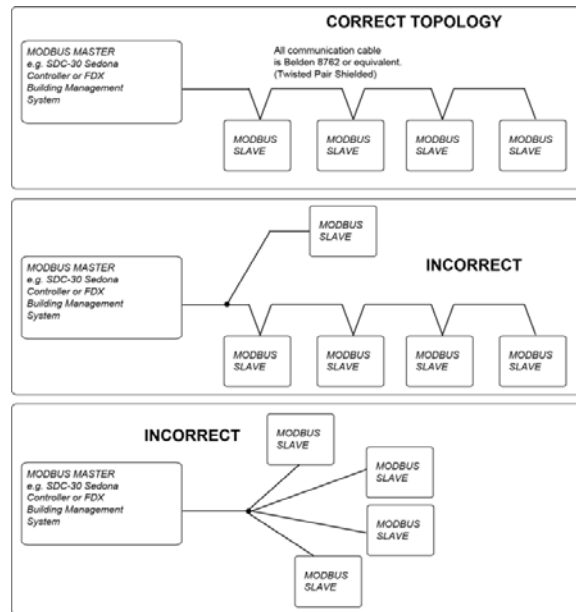
Modbus and other communication protocol rely on the quality of cable and good installation practises

to ensure reliable communications. Modbus requires the use of screen cable with the drain grounded in a single location.

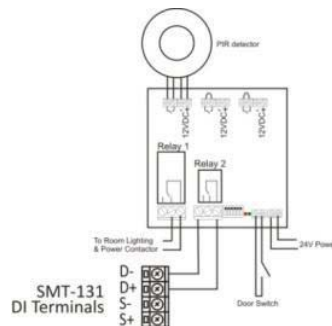
Hint! When the SRC-131 is connected to a working Modbus Network and receiving valid data, the decimal point in the temperature display will blink. If there is no communication or the SMT-131 is receiving corrupted data, this decimal point will remain on steady.



Modbus relies on a series connection and will normally not tolerate "Star" wiring or "T" branches.



5.3 Occupancy Input

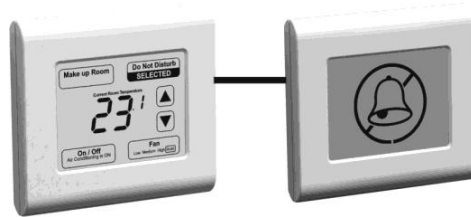


When the room is detected "unoccupied" by a third party device or the optional SyxthSense SRC-OC occupancy detection system, the SRC-131 will replace the user set point with installer pre-set temperatures or alternatively, turn the controller off. The user settings will return when the room is again occupied.

The Digital Inputs in the SRC-131 are volt free. To initiate the "unoccupied" function simply bridge the D+ and D- terminals through a clean contact (switch or relay terminal).

5.4 Outside Door Station

When coupled with the optional SyxthSense door station the guest has the ability to set the room as "Do Not Disturb", call for housekeeping or be alerted to visiting guests with a pleasant doorbell chime. Hotel staff are informed about the room status or guest's needs by text information displayed on the door station LCD as well as the door station backlight colours.

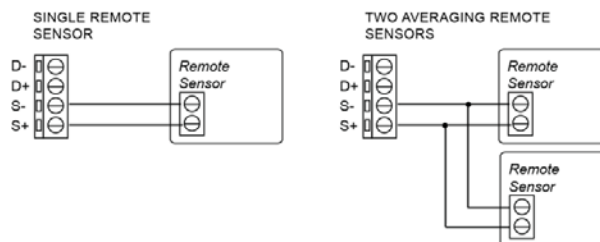


Connection between the SRC-131 and the hotel door station is by the supplied 1 metre cable fitted with RJ12 plugs. Longer cables up to 10 metres maximum can be supplied at extra cost.

When fitting the door station, the SRC-131 DIP Sw8 must be ON. The outside door station will flash all LCD segments if DIP Sw8 is in the wrong position.

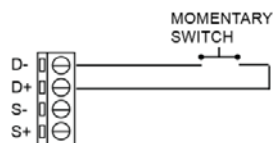
5.5 Remote Temperature sensors

Occasionally the room controller cannot be installed in the ideal location to measure the room temperature accurately. In these circumstances the SRC-131 can use optional remote temperature sensors. These are a two wire device, not polarity dependent and simply wired into the SRC-131 sensor inputs terminals. Depending on installer menu sensor settings, shown on page 11, remote sensor(s) will either override the SRC-131 onboard sensor or average with the onboard sensor. Multiple sensors can be used for averaging over larger areas if necessary. Wireless (RF) remote sensors are also available if wiring cannot be installed economically.



5.6 Doorbell

A built in doorbell feature is included with the SRC-131 controller. This is normally activated by the optional door station or via Modbus data link. In circumstances where this is not convenient, the digital input terminals can be assigned as a doorbell switch with the digital input options detailed in the installer menu on page 11. Simply place a momentary volt free switch across the S+ and S- terminals to activate the doorbell. Once pressed, the doorbell will chime for 10 seconds.



6 Installer Options Menu

The SRC-131 has an impressive list of options that can be installer selected. These options tune the controller's performance as well as set energy conservation settings. This menu is deliberately hidden and difficult to enter to discourage unauthorised tampering.

The 2 steps to enter the installer menu are:

1. Ensure that the controller is OFF
2. Press and hold both the top left (make up my room button) and bottom right (fan mode) together for 10 seconds or until the display changes and shows "installer mode"

6.1 Navigating Through The Installer Mode Settings

The bottom right button steps forward through the menu options, the bottom left button steps you backwards.

Adjust your options with the up/down buttons.

Exit the menu saving changes by pressing and holding the bottom right (fan button) or waiting. The SRC-131 will exit this menu automatically after 20 seconds.

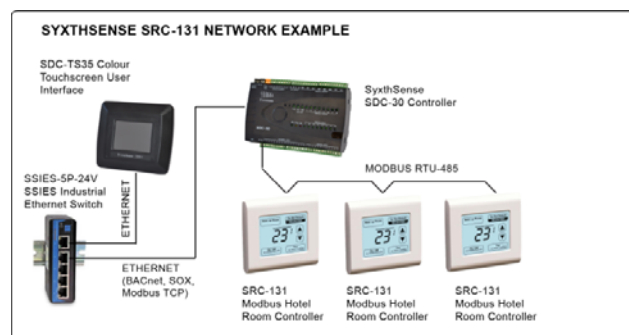
6.2 Option List Table

	Option	Setting
0	User Temperature Display	0 = Show Room and Set temperature <i>(Default)</i> 1 = Show Set Temperature Only
1	Temperature Format	C = Degrees Celsius <i>(Default)</i> F = Degrees Fahrenheit
2	High Set Point Limit	Off, then 5°C to 30°C (41°F to 95°F) <i>(Default = 30°C)</i>
3	Low Set Point Limit	Off, then 5°C to 30°C (41°F to 95°F) <i>(Default = 5°C)</i>
4	User Set Point Dead Band	0.5°C to 5°C in 0.5°C Steps <i>(Default = 1°C)</i>
5	Span (Relays Hysteresis)	0.5°C to 3°C in 0.5°C Steps <i>(Default = 0.5°C)</i>
6	Indoor Fan Purge	0 = Off 1 = Fan Purge - 1 Min 2 = Fan Purge - 3 Min 3 = Fan Purge - 5 Min 4 = Fan Purge - 10 Min 5 = Heat Only Fan Purge - 1 Min 6 = Heat Only Fan Purge - 3 Min 7 = Heat Only Fan Purge - 5 Min 8 = Heat Only Fan Purge - 10 Min 9 = Cool Only Fan Purge - 1 Min 10 = Cool Only Fan Purge - 3 Min 11 = Cool only Fan Purge - 5 Min 12 = Cool Only Fan Purge - 10 Min Note - A 15 second fan purge is applied in all modes
7	0-10 Volt Heat Span	0.5°C to 3°C in 0.5°C Steps <i>(Default = 1°C)</i>
8	0-10 Volt Cool Span	0.5°C to 3°C in 0.5°C Steps <i>(Default = 1°C)</i>
9	Auto Off Timer	Off, then 1 to 10 Hours in 30 Min Intervals <i>(Default = OFF)</i>
10	Unoccupied Heat Setpoint	Off, then 5°C to 30°C (41°F to 86°F) <i>(Default = OFF)</i>
11	Unoccupied Cool Set Point	Off, then 5°C to 30°C (4°F to 86°F) <i>(Default = OFF)</i>
12	Unoccupied Fan Mode	1 = Low (Auto) <i>(Default)</i> , 2 = Med (Auto) 3 = High (Auto) 4 = Low (On) 5 = Med (On) 6 = High (On)

13	Backlight	0 = On With Button Press Only 1 = Always On (High Brightness) 2 = Low Then High With Button Press (Default)
14	Sensor Input Functions	rS = Use In Place Of Onboard Sensor (Default) Au = Average Onboard And Remote Sensor dA = Display Sensor Value In Modbus Only
15	Digital Input Functions	OC = Initiate Unoccupied Mode (Default) db = Chime The Doorbell (Sw8 Must Be Off)
16	Reset Indoor Fan Mode	0 = Off (Default) 1 = On (If user sets fan to continuous mode, when the user turns the controller off the fan mode will reset back to automatic mode)
17	Belimo Mode	0 = Off (Default) 1 = On Defines 0-10V Output For Belimo 6 Way Actuator
18	Modbus Address	1 to 255 (Default = 7)
19	Communications Baud	0 = 4.8K 1 = 9.6K (Default) 2 = 19.2K
"r"	Factory Reset	0 = Off (Default) 1 = Force Reset - Resets All Installer Settings

6.3 Modbus Data

The SRC-131 has integrated Modbus RTU communications. Using a Modbus master controller such as the SyxthSense Sedona SDC-30 many of the SRC-131 room controller features can be centrally controlled and monitored.



Modbus is a simple protocol that is extremely popular due to its robustness and simple implementation. It is also a "forgiving" protocol and will tolerate many installation errors. This being stated however, correct wiring practices should be used to achieve maximum reliability. See earlier details on wiring Modbus networks.

The SRC-131 Modbus data is within the "40XXX" range, this being holding registers. Depending on your choice of Modbus Master you may need to enter the address using the full address - such as "40012" or by selecting "Holding Registers" and entering the address simply as "12".

6.3.1 Data Format

Protocol: Modbus RTU
 Byte Format: 1 Start Bit, 8 Data Bits, 1 Stop Bit, No Parity
 Address: 1 to 255
 Baud: 4800 / 9600 / 19200 BPS

Holding Register	Type	Value	Comments
40001	Read Only	Device ID	Always Returns "131"
40002	Read Only	Firmware Version	Divide By 100 (e.g. Version 2.36 = 236)
40003	Read Only	DIP Switch Settings	Binary Count Sw 1 = 1, Sw2 = 2, Sw3 = 4, Sw 4 = 8 etc
40004	Read / Write	Occupancy Status	0 = Room is Unoccupied 1 = Room is Occupied Note - Modbus can write "0" holding the room unoccupied regardless of the occupancy input. Modbus cannot override the occupancy input and hold the SRC-131 in occupied mode.
40005	Read Only	Bell Status	0 = Bell Is Silent 1 = Bell Is Chiming
40006	Read / Write	Door Station Status	0 = Normal - No Activity 1 = "Make Up Room" Active 2 = "Do Not Disturb" Active
40007	Read / Write	HVAC Status	0 = Air Conditioning Off (1 or 3 Fan Speed) 1 = Low Speed Ventilation (1 or 3 Fan Speed) 2 = Med Speed Ventilation (3 Fan Speed Only) 3 = High Speed Ventilation (3 Fan Speed only) 4 = Air Conditioning ON (1 or 3 Fan Speed)
40008	Read / Write	Fan Status	3 Fan Speed Mode 0 = Low (Fan Auto) 1 = Med (Fan Auto) 2 = High (Fan Auto) 3 = Auto Fan Speed (Fan Auto) 4 = Low (Fan On) 5 = Med (Fan On) 6 = High (Fan On) 7 = Auto Fan Speed (Fan On) 1 Fan Speed Mode 0 = Fan Auto 4 = Fan On
40009	Read / Write	User Set Point	Deg C = 0.5°C Steps Deg F = 1°F Steps Value / 10 (e.g. 23.5°C = 235)
40010	Read / Write	Contact Reception Notification	0 = Off 1 = Show Contact Reception on LCD SRC-131 LCD will flash "Contact Reception" on LCD and sound chime. User may accept alert by touching any button on SRC-131
40011	Read Only	Room Temperature	Value / 10 (e.g. 21.7c = 217)
40012	Read / Write	Temperature Display	0 = Show Room and Set Temperature 1 = Show Set Temperature Only
40013	Read/Write	C/F Display	0 = Deg C format 1 = Deg F format
40014	Read / Write	User Set Point High Limit	5°C to 30°C Range (41°F-86°F) in 1°C/F Steps 1:1
40015	Read / Write	User Set Point Low Limit	5°C to 30°C Range (41°F-86°F) in 1°C/F Steps 1:1
40016	Read / Write	Dead Band	0.5°C to 5.0°C in 0.5°C Steps 1.0°F to 10.0°F in 1°F Steps Value / 10 (e.g. 1.5°C Dead Band = 15)
40017	Read / Write	Relay Span	0.5°C to 3.0°C in 0.5°C Steps 1°F to 10°F in 1°F Steps Value / 10 (e.g. 1.0°C Span = 10)

40018	Read / Write	Fan Purge Period	0 = Off 1 = Fan Purge - 1 Min 2 = Fan Purge - 3 Min 3 = Fan Purge - 5 Min 4 = Fan Purge - 10 Min 5 = Heat Only Fan Purge - 1 Min 6 = Heat Only Fan Purge - 3 Min 7 = Heat Only Fan Purge - 5 Min 8 = Heat Only Fan Purge - 10 Min 9 = Cool Only Fan Purge - 1 Min 10 = Cool Only Fan Purge - 3 Min 11 = Cool Only Fan Purge - 5 Min 12 = Cool Only Fan Purge - 10 Min
40019	Read / Write	0-10V Heat Span	0.5°C to 3°C in 0.5°C Steps 1°F to 6°F in 1°F Steps Value / 10 (e.g. Heat Span of 1°C = 10)
40020	Read / Write	0-10V Cool Span	0.5°C to 3°C in 0.5°C Steps 1°F to 6°F in 1°F Steps Value / 10 (e.g. Cool Span of 1°C = 10)
40021	Read / Write	Auto Off Timer	0 = Off 1 to 10 Hours. Value / 10 (e.g. 3 Hour Auto Off Timer = 30)
40022	Read / Write	Unoccupied Heat Set Point	0 = Off 5°C to 30°C in 0.5°C Steps 41°F to 86°F in 1°F Steps Value / 10 (e.g. 17°C Unoccupied Heat = 170)
40023	Read / Write	Unoccupied Cool Set Point	0 = Off 5°C to 30°C in 0.5°C Steps 41°F to 86°F in 1°F Steps Value / 10 (e.g. 28.5°C Unoccupied Cool = 285)
40024	Read / Write	Unoccupied Fan Mode	3 Fan Speed Mode 1 = Low (Fan Auto) 2 = Med (Fan Auto) 3 = High (Fan Auto) 4 = Low (Fan On) 5 = Med (Fan On) 6 = High (Fan On) 1 Fan Speed Mode 0 = Fan Auto 4 = Fan On
40025	Read / Write	Backlight	0 = On With Button Press 1 = Always On (High) 2 = Always On Low - High With Button Press
40026	Read / Write	Remote Temperature Input Function	0 = Replace On Board Sensor With Remote 1 = Average Onboard Sensor With Remote 2 = Modbus Use Only (e.g. Coil Temp Monitor)
40027	Read / Write	Digital Input Function	0 = Occupancy Initiate 1 = Chime Door Bell
40028	Read / Write	Reset Fan Mode	0 = Leave Fan Mode Unchanged 1 = Reset Fan To Auto At Switch Off
40029	Read / Write	Belimo Mode	0 = Standard 0-10V Valve Logic 1 = Belimo 6V = Off 3 Way Valve Logic
40030	Read / Write	Modbus Address	1 to 255
40031	Read / Write	Baud Rate	1 = 4.8Kbs 2 = 9.6kbs 3 = 19.2Kbs
40032	Read Only	Digital Input Status	0 = Open 1 = Closed
40033	Read Only	Internal Sensor Value	Value / 10 (e.g. 23.3°C = 233)
40034	Read Only	Remote Sensor Value	Value / 10 (e.g. 21.8°C = 218)
40035	Read Only	W relay status	0 = Off 1 = Energised
40036	Read Only	Y Relay Status	0 = Off

			1 = Energised
40037	Read Only	High Fan Relay Status	0 = Off 1 = Energised
40038	Read Only	Medium Fan Relay Status	0 = Off 1 = Energised
40039	Read Only	Low Fan Relay Status	0 = Off 1 = Energised
40040	Read Only	0-10V Heat Value	0..100% (e.g. 7.3V = 73%)
40041	Read Only	0-10V Cool Value	0..100% (e.g. 2.1V = 21%)

7 Specifications

Input Voltage:	24VAC 50/60 Htz +/- 15%
Operating Temperature:	0°C to 50°C (32°F to 122°F)
Operating RH:	0-95% (Non Condensing)
Storage Temperature:	0°C to 65°C (32°F to 150°F)
Size:	113 x 103 x 25mm.
Display Size:	69.5 x 46.3mm.
Backlight:	White LED (Other Colours Available Upon Request)
Display Type:	STN Touch Panel
Relay Rating:	30V @ 1Amp Max
0-10V Output Load:	10mA Max
Control Range:	5°C to 30°C (41°F to 86°F)
Memory Type:	Non Volatile - Settings Do Not Require Battery Backup
Communications:	Modbus RTU 4 .8K / 9.6K / 19.2 K, 1 Stop Bit, 8 Data Bits, 1 Start Bit. No Parity.
Plastic:	ABS / Poly Blend – UV Stabilised and Fire Rated
Warranty:	2 Year RTB



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